Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 06, June 2025
brightmindpublishing.com
ISSN (E): 3061-6964

PROSPECTS FOR USING THE STEAM APPROACH1 IN THE EDUCATIONAL PROCESS

Pazilova Shokxida Abdulbasitovna
PhD, Associate Professor of the Academy of the
Armed Forces of the Republic of Uzbekistan

Abstract
This article examines the compatibility of the Steam approach with the ability for self-learning and teamwork, and the benefits of an effective interactive learning approach. The article describes how the STEAM approach differs from the traditional type of learning and how students' thinking develops.

Keywords: STEM integration, STEAM, education, natural sciences, technology, engineering, mathematical sciences.

Introduction

In the context of the global transformation of modern education, integrative approaches to learning are becoming increasingly relevant since the training of highly qualified specialists requires comprehensive knowledge and skills. Key factors: improving the qualifications of teachers, introducing modern methods and innovative technologies. This contributes to the development of students' intelligence and the training of competitive specialists. In order to ensure modernization and stable socio-economic development of the country, the state directs efforts to the development of human capital and the training of highly qualified personnel.

According to the Decree of the President of the Republic of Uzbekistan dated October 8, 2019 No. PF-5847 “On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030”, higher education is tasked with such tasks as the development of information and communication technologies (ICT) and new teaching methods, mastering the basics of STEAM pedagogy, forming the necessary knowledge base for acquiring new professional competencies, taking into account the needs of in-demand personnel. The structure of the updated standards of higher education in the field

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 06, June 2025
brightmindpublishing.com
ISSN (E): 3061-6964

of natural sciences is based on the results of scientific research on teaching and learning methods in this area. These standards define the key competencies and knowledge that must be mastered by students at each stage of training.

For modern Uzbekistan, which strives for greater technologization and digitalization of the economy, the introduction of innovative technologies not only in education but also in other areas, STEAM education is certainly relevant. This is complemented by the fact that with globalization, the labor market is becoming increasingly competitive.

Preparation for any profession is always a complex and lengthy process. Such a process is usually accompanied by the study of a large amount of information related to the chosen activity or profession. Each training profile provides for the study of a large number of special disciplines, the study of which is carried out in a certain sequence. This principle is due to the fact that each discipline studied is aimed at the formation of certain competencies, and already formed competencies contribute to the high-quality formation of new competencies. Thus, when teaching students, much attention is paid to interdisciplinary interaction.

Interdisciplinary interaction is an important condition in the educational activities of educational institutions, including higher military educational institutions, since this process is aimed at training highly specialized specialists capable of independent development. In addition, interdisciplinary connections are capable of not just duplicating the material covered, but using it to synthesize new knowledge and consolidate the material being studied.

Cadets studying in a certain field of study, at the head of the studied disciplines, highlight only those that, in their opinion, can be useful in their future professional activities. In the role of such disciplines, cadets highlight those that form professional competencies.

Using the interdisciplinary principle may not always be possible, since some topics in certain disciplines may have a narrow focus and not be reflected in other disciplines. In addition, the interdisciplinary approach is largely theoretical in nature, so its application is not always possible when conducting practical classes. Taking into account the above, there is a need to search for an alternative teaching approach, the use of which would be possible in different types of classes, and which would be based on the principle of interdisciplinary interaction. Today, one of such approaches is STEM education, which has proven itself well in foreign countries.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 06, June 2025
brightmindpublishing.com
ISSN (E): 3061-6964

The idea of STEM education is based on a combination of theoretical and applied skills. Natural sciences provide knowledge about the world around us, laws and phenomena of nature, the structure of living organisms around us, etc. Technology makes it possible to apply the obtained scientific knowledge in practice. Engineering, using certain materials, allows modeling and visualizing the obtained knowledge. And knowledge of the mathematical field, when performing certain algorithms, can affect the substantive component of knowledge obtained during the integration of the above areas of knowledge.

STEAM - (Science, Technology, Engineering, Arts, Mathematics) is the integration of natural sciences, technologies, engineering, arts and mathematics into a single educational concept. This direction has become relevant due to the presence of an interdisciplinary approach, the development of critical and creative thinking, early preparation for modern professions, and the formation of innovative skills.

STEAM helps students develop important functions and skills, such as a comprehensive understanding of problems, creative thinking, an engineering approach, critical thinking, understanding and applying scientific methods, and understanding the basics of design. In today's world, many professions are becoming unclaimed, and new ones are emerging that require high intellectual development.

The STEAM approach is significantly different from the traditional one:

1. Students devote more time to self-study, learn to find problems and solve them independently.

2. Students share their successful and unsuccessful educational experiences with each other, work together on projects or solving specific problems. 3. Students help and support each other, solving educational problems using new skills and knowledge.

The approach is based on a combination of theoretical and applied skills:

Natural sciences explain the laws of nature that we encounter every day;

Technology allows you to test scientific knowledge in practice;

Engineering helps to work with resources, materials, teaches you to experiment, improve the environment;

Mathematics develops accuracy, logical thinking, the ability to follow algorithms;

Arts, humanities - the path to understanding social and historical processes, communicating with people.

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 06, June 2025
brightmindpublishing.com
ISSN (E): 3061-6964

Thus, compared to the traditional education system, STEAM - training is focused on experiments, constructing models, independently creating creative works, translating their ideas into reality. As a result, students receive a product of their activities, and this is very important.

The introduction of STEAM is a response to the challenges of modern digitalization, which requires people to be flexible in thinking. The development of this flexibility is especially important for students in the formation of cognitive activity and interest in science. STEAM is an interdisciplinary approach that develops students' cognitive skills, creativity and critical thinking to solve problems in the modern world.

Benefits of implementing STEAM technologies in education: The STEAM approach is not only a teaching method, but also a way of thinking. In a STEAM educational environment, students gain knowledge and immediately learn to use it. Therefore, when they face life problems in the real world, they understand that such complex issues can only be solved by relying on knowledge from different fields and working together. Relying on knowledge in only one subject is not enough here. The STEAM approach changes our view of learning and education. By focusing on practical abilities, students develop their willpower, creativity, flexibility and learn to cooperate with others. These skills and knowledge constitute the main learning objective, i.e., what this entire education system strives for.

STEAM education in Uzbekistan is at the stage of active development and requires significant efforts to achieve its goals. Uzbekistan has significant potential for the development of STEAM education, which can become a key factor in economic growth and innovative development of the country. To achieve these goals, a comprehensive solution to the identified problems is required, including modernization of infrastructure, advanced training of teachers, updating of curricula, and motivation of students. The development of STEAM education will allow Uzbekistan to train qualified specialists capable of making a significant contribution to scientific and technological progress, economic prosperity and sustainable development of the country in the context of global competition.

STEM education is based on the following principles: interdisciplinarity and interactivity - combining knowledge from different scientific fields of knowledge into a single whole, describing one phenomenon from different points of view; practical use of knowledge - the ability to apply the acquired knowledge in solving

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 06, June 2025
brightmindpublishing.com
ISSN (E): 3061-6964

practical problems; creativity and critical thinking - the ability to solve and find solutions to practical problems in a variety of ways, moving away from standard algorithms.

Thus, STEM education in higher military educational institutions will be presented in the form of integration of military disciplines, technology, engineering and mathematics. Interdisciplinary interaction of military disciplines will allow cadets to develop a comprehensive understanding of military activity, as well as to consolidate knowledge on the relevant training profile at the highest quality level. From the engineering point of view, the knowledge acquired by cadets can be visualized using certain tools in the form of models, dummies, samples of official documents, etc. The totality of the acquired knowledge and visual images of a particular area of military activity will be accompanied by certain processes, the construction of which will be based on the implementation of certain algorithms presented by the relevant technologies. And mathematics will allow for the adjustment of technological processes if appropriate changes are made to the structure and content of the subject being studied.

The difference between STEM education and the interdisciplinary approach is that training in the STEM format is aimed not only at combining knowledge from different disciplines into a single whole, but also at explaining the processes associated with the acquired knowledge from the point of view of the disciplines that make up STEM education.

The possibility of using STEM education in training cadets of higher military educational institutions will not only combine the knowledge of various disciplines studied at universities, but also establish a close relationship between them, as well as consolidate them at a practical level. Establishing a relationship between the disciplines studied will contribute to a better formation of the necessary competencies and the achievement of the requirements for graduates of higher military educational institutions.

REFERENCES

1. «Об образовании» [Электрон ресурс]: закон Республики Узбекистан от 23.09.2020 г. № ЗРУ-637. - https://lex.uz/docs/5013009.
2. Об утверждении концепции развития системы народного образования Республики Узбекистан до 2030 года [Электрон ресурс]: указ Президента

Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 06, June 2025
brightmindpublishing.com
ISSN (E): 3061-6964

Республики Узбекистан, от 29.04.2019 г. № УП-5712. – URL: https://lex.uz/docs/4312785.

3. Рафикова, Р. А. Совершенствование STEAM-технологий как требование времени. / Рената Анатольевна Рафикова. // Лучшие интеллектуальные исследования. -2024. - №22(3). - С.407 - 413.
4. Уваров, А. Ю. Инновационные педагогические практики: распространение [Текст]. / А. Ю. Уваров. // Школьные технологии. - 2008. - №3. - С.55-63.
5. Сологуб, Н.С. Особенности построения учебной дисциплины «STEAM-подход в естественнонаучном образовании» в контексте подготовки будущих учителей естественнонаучных учебных предметов. / Н.С. Сологуб. // Высшая школа. - 2021. - № 3. - С.47-52.
6. Pazilova Sh. A. The importance of the STEAM approach in today's education system. / Sh. A. Pazilova. // Web of Teachers: Inderscience Research 3(5), 313-315, 2025.
7. Авазбоев, А. Сущность и преимущества технологии обучения, основанной на подходе «STEAM-образование». / А. Авазбоев, М. Жамалдинова. // Междисциплинарный электронный научный журнал «Общество и инновации». - 2021. - Т.2. -№5. - С.109-115.